

Appl. No. : 09/991,580
Filed : November 15, 2001

REMARKS

In response to the Office Action, Applicant respectfully requests the Examiner to reconsider the above-captioned application in view of the foregoing amendments and the following comments.

Discussion of Objections to Claims

In the Office Action, the Examiner made certain objections to Claims 23-29 because they are dependent on a cancelled Claim. Applicant has corrected this defect by amending these claims to be dependent on Claim 22. In light of these amendments, Applicant respectfully requests the Examiner to remove his objections to these claims.

Discussion of Claim Rejections Under 35 U.S.C. § 102(e)

In the Office Action, the Examiner rejected Claims 2-16, 22, 30, 32, and 34-38 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,546,814, to Choe. Applicant respectfully disagrees with these rejections.

A claim is anticipated under 35 U.S.C. § 102(e) only if each and every element as set forth in the claim is found, either expressly or inherently described in a single prior art reference. Applicant respectfully submits that at least one limitation from each of the above-listed claims is not taught or described by Choe. Choe is generally directed to estimating torque in rotating machinery. *See* col. 2, lines 5-54. In contrast, Applicant's invention is generally directed to identifying bearing damage that is due to vibration.

Claims 2, 4, 6, 9, 10, 16, 22, 30, 34 and 35

Claim 2 recites "enveloping the vibration signal data." Independent Claims 4 and 6 each includes similar limitations. In the Office Action, the Examiner wholly failed to particularly identify where this limitation was taught or suggested by the prior art and with respect to this, Applicant respectfully submits has failed to provide valid *prima facie* rejections and the claims are in condition for allowance.

Furthermore, Applicant respectfully submits that with respect to independent Claim 2, 30, and 34, Choe fails to teach or suggest excluding from a measured amplitude certain bearing defect frequencies. Claim recites "determining a noise floor of a frequency domain signal,

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wherein determining excludes a portion of the frequency domain signal that is associated with damage or original manufacture defects.” Claim 30 recites “measuring vibration amplitudes of frequencies other than the bearing defect frequencies to define a noise floor.” Independent Claim 34 includes similar limitations. Choe describes determining whether there is excessive vibration is occurring. *See* lines 42-48. Choe describes dividing a spectrum into a plurality of discrete bands. *See* col. 15, lines 49-67. As part of this analysis, the Choe system analyzes peak energy at each of the discrete bands to determine if a defect is present. However, Choe fails to teach or suggest, wherein a noise floor “excludes a portion of the frequency domain signal that is associated with damage or original manufacture defects” as is recited in Claim 2 or “measuring vibration amplitudes of frequencies other than the bearing defect frequencies to define a noise floor” as is recited in independent Claims 30 and 34.

Furthermore, with respect to independent Claims 2, 4, 6, 9, 10, 16, and 22 Applicant respectfully submits that Choe fails to teach or suggest *dividing the amplitude of a frequency domain signal by a noise floor.*” Chen describes diving a spectrum into certain bands, not dividing an amplitude of a frequency domain signal. *See* col. 15, lines 49-50. To determine an error, Choe determines the average spectral energy of each of the discrete bands and determines whether the band is in excess of threshold. *See* col. 16, 18-49. Choe does not teach or suggest dividing the average by a noise floor. Since Choe fails to teach or suggest this limitation, Applicant respectfully submits that these claims are in condition for allowance.

Furthermore, with respect to Claim 35, Applicant respectfully submits that Choe fails to teach or suggest “wherein the filter has a cut off frequency that is based at least in part upon the angular velocity of a rotating shaft in the vibrating device.” In the Office Action, the Examiner took the position that this was shown on col. 7, line 46 - col. 8, lines 29 of Choe. These cited sections merely describe providing a predefined cutoff frequency for a temperature sensor (col., 7, lines 47-64) and a vibration sensor (col. 7 line 65- col. 8 line 29). Applicant respectfully submits that the cited sections fails to teach or suggest setting a cutoff frequency based upon the angular velocity of a rotating shaft.

Claims 3, 5, 7, 8, 11-15, 23-29, and 36-38

Since Claims 3, 5, 7, 8, 11-15, 23-29, and 36-38 each depend on one of independent Claims 2, 4, 6, 10, 16, 22, and 35, Applicant respectfully submits that these claims are allowable for at least the above-reasons and in addition the subject matter of their own limitations.

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Summary

Applicant has endeavored to address all of the Examiner's concerns as expressed in the outstanding Office Action. Accordingly, amendments to the claims for patentability purposes, the reasons therefore, and arguments in support of the patentability of the pending claim set are presented above. Any claim amendments which are not specifically discussed in the above remarks are not made for patentability purposes, and the claims would satisfy the statutory requirements for patentability without the entry of such amendments. In addition, such amendments do not narrow the scope of the claims. Rather, these amendments have only been made to increase claim readability, to improve grammar, and to reduce the time and effort required of those in the art to clearly understand the scope of the claim language. In light of the above amendments and remarks, reconsideration and withdrawal of the outstanding rejections is specifically requested. If the Examiner has any questions which may be answered by telephone, he is invited to call the undersigned directly.

Respectfully submitted,

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